

THE BURDEN OF ALLERGIC RHINITIS

Robin J Green, PhD

Associate Professor, University of Pretoria, Pretoria, South Africa

Gloria Davis, Dip Allergy (SA)

Private Practice, Johannesburg, South Africa

ABSTRACT

Allergic rhinitis produces direct symptoms of rhinorrhoea, sneezing, pruritus and nasal congestion, as well as complications which often relate to other areas of the respiratory tract, including the middle ear space, producing otitis media with effusion, and the sinus cavities, producing both chronic sinusitis and episodic infective acute sinusitis. Two significant complications of allergic rhinitis are asthma and impaired quality of life. This is a condition which carries enormous cost implications, direct, indirect and intangible. Treatment should be instituted to reverse symptoms and complications but clearly the selection of medication is of critical importance as some medications, the older generation (or sedating antihistamines) specifically, threaten to do more harm than good, further impairing quality of life and escalating cost.

INTRODUCTION

The concept of the burden of a disease is an interesting one because it encompasses concepts beyond our traditional view of illness, i.e. pain and suffering. A disease, especially a chronic one like allergic rhinitis, has an impact on a sufferer through both the direct and indirect symptoms, complications (including health-related quality of life) and cost (direct, indirect and intangible costs). All of these factors contribute to the burden of rhinitis. It is useful to think of allergic rhinitis in this way since it allows us to remember all the facets of this chronic disease and shifts our thinking to the seriousness of what some would call a trivial condition with irritating nasal symptoms.

The ISAAC (International Study of Asthma and Allergy in Children) study¹ measured the prevalence of allergic diseases, including allergic rhinitis, in many countries around the world. In South Africa the prevalence of this condition in 13-14-year-old children is 16-17%, making it the commonest chronic condition in children. Allergic rhinitis, like other allergic conditions, is on the increase around the world.

SYMPTOMS AND COMPLICATIONS

Allergic rhinitis produces direct symptoms of rhinorrhoea, sneezing, pruritus and nasal congestion. However, a high index of suspicion is required as many patients and parents do not complain of the direct symptoms of this disease. Useful diagnostic tools are the indirect features as a result of ongoing nasal congestion (the so-called 'allergic facies'): a hangdog or tired facial expression, characteristic mouth breathing, allergic shiners or dark rings beneath the eyes, a nasal crease and a watery nasal discharge. Very significant in

allergic rhinitis are the complications of the disease, especially those of persistent allergic rhinitis. Complications often relate to other areas of the respiratory tract including the middle ear space, producing an otitis media with effusion, and the sinus cavities, producing both chronic sinusitis and episodic infective acute sinusitis. The long face syndrome, with dental malocclusion, and of course impaired quality of life, are very real and significant complications of this disease.² Probably the most important complication of allergic rhinitis is asthma. Up to 40% of asthma sufferers have allergic rhinitis as a cause of associated nasal symptoms.³ Asthma has a very real association with allergic rhinitis.

Quality of life

We know today that allergic rhinitis impairs quality of life, beyond simply having symptoms. The quality of life of an individual with allergic rhinitis is often as severely impacted upon as that of someone with severe asthma.

'Quality of life' is the sum of factors contributing to the well-being of people. The many facets include physical, occupational, social, financial, spiritual and, in this context, health-related well-being.^{4,5} Schipper *et al.*⁶ defined health-related quality of life as 'the functional effects of an illness and its consequent therapy upon a patient, as perceived by the patient'. The modern shift is therefore not for clinicians to assess the impact of a disease and the outcomes of a medical intervention on clinical grounds alone, but for patients themselves to contribute to this assessment. To many clinicians this measure is a soft end-point as it does not focus on measurable clinical parameters, laboratory investigations, health care use or mortality, but looks rather at overall impact from a patient perspective. Health-related quality of life may involve two distinct concepts: the patient's assessment of the disease **outcome**, in all its expressions, and of quality of **care**. Moreover, it is obvious that the cost of care could also impact on quality of life, as both direct and indirect costs could detract from overall well-being. Measuring health-related quality of life is not easy. A number of instruments, usually questionnaire-based, are used. Two types of questionnaires are available: generic (designed to be applicable to patients in all disease states),⁷ and specific (specific to one disease state). Generic tests have the distinct advantage of allowing comparison of different diseases in terms of burden of illness. For example, the impact of asthma on quality of life can be compared with chronic rhinitis directly. However, a disadvantage is that specific problems relating to a disease cannot be measured. In allergic rhinitis subtle problems may have a profound impact on health, and need to be measured; therefore, disease-specific questionnaires are important in this condition.

By means of a generic health profile (SF-36) Bousquet *et al.*⁸ have shown that patients with perennial rhinitis may be more troubled by symptoms than patients with asthma. This is very important at a paediatric level. A poor night's sleep the night before impacts on school performance.⁹

Following extensive development and testing Juniper *et al.*¹⁰ produced the Rhinoconjunctivitis Quality of Life

Correspondence: Prof. RJ Green, PO Box 1150, Randpark Ridge 2156. Tel 012-673-8511, fax 012-673-8611, email robgreen@global.co.za

Questionnaire, which has proved useful in clinical trials involving rhinoconjunctivitis and/or rhinitis.^{11,12} In general, these studies have shown the importance of quality of life assessment in a condition with many facets. The Rhinoconjunctivitis Quality of Life Questionnaire highlighted the deleterious effects of rhinitis on systemic symptoms, sleep, activities and emotional state. Interestingly, despite the relatively small effects of treatment on primary nasal symptoms, differences in areas such as sleep, activity and emotional function were profound, suggesting that even relatively minor illnesses can have important deleterious effects on quality of life.

Rhinitis seldom causes death, and although this has perhaps trivialised its status, it places greater emphasis on patient well-being as an outcome measure. In fact, the major reason for treating allergic rhinitis is to improve quality of life, as the patient's life is not at risk.¹³ This having been said, assessment of health-related quality of life in rhinitis is largely a research tool, hardly ever used in clinical practice, except at the most basic level of 'How do you feel?'

Numerous measures exist for determining the severity of rhinitis, including nasal symptom severity, rhinomanometry, cytology and nasal hyperactivity.^{9,14} The last three are seldom used. Evidence is now available that questions the relationship between these conventional clinical markers of nasal inflammation and patient-perceived quality of life.^{8,9} The reason is the mental translation that individual patients make in interpreting symptoms and their impact on daily activity. Table I highlights the many impacts of rhinitis on cognitive functioning in children.^{11,12}

Table I. Allergic rhinitis: CNS effects^{11,12}

Cognitive function

- Attention difficulties
- Sluggishness in thought process
- Confusion
- Psychomotor slowing
- Memory lapses

Mood rating

- Irritability
- Apathy
- Sleepiness
- Anxiety
- Depression

The symptoms that disturb patients with rhinitis include local nasal symptoms such as a blocked or runny nose, but more importantly, quality of life is disturbed by poor sleep and daytime lethargy. It is obvious that if allergic rhinitis and asthma both impact on quality of life, having both diseases, which occurs in a large number of patients, is going to impact that much more so on the quality of life of an individual.¹⁵ In a prospective study involving 567 unselected children consecutively attending an allergy practice in Johannesburg, during the 14-month period from October 1994 to November 1995, both symptoms as well as the problems associated with allergic rhinitis were documented.¹⁶ Subjects were included in the analysis if at their initial visit they were diagnosed as having chronic non-infectious rhinitis, and if at follow-up were shown to have responded to topical (anti-inflammatory) treatment.

Daytime tiredness and irritability were frequently reported, but by far the most worrying aspect of this component of the disease complex was the high rate

of learning difficulties at school. Nearly 1 in 4 of the school-aged children reported some form of learning problem at school. The impact of chronic (allergic) rhinitis on health-related quality of life is apparent from this study. Analysis of this nature is especially important in assessing a condition in which objective testing of severity is either not possible or not routinely used. In this study the degree to which quality of life was affected by rhinitis was greater than expected.

Allergic rhinitis is a very common problem in South Africa. It is also a condition that carries with it the risk of serious morbidity if not properly managed. This morbidity is an impairment of quality of life, often through the effect of the disease on sleep and then functioning the next day. For children this impact is borne in the classroom where learning takes place. Many children with allergic rhinitis have learning disabilities.

Treatment should be instituted to reverse symptoms and complications but clearly the selection of medication is of critical importance as some medications, the older-generation (or sedating) antihistamines specifically, threaten to do more harm than good. These antihistamines are completely cost-ineffective and should never be used under any circumstances for allergic rhinitis.⁵

THE COST OF ALLERGIC RHINITIS

The direct costs of a disease, i.e. resources consumed, include costs associated with drugs and devices, doctors' visits, and hospital costs. The indirect costs of a disease are defined as resources lost, and include time off work as a result of illness, time spent by people looking after the patient at home, and premature retirement or death (Table II). It is easy to assess direct costs, but indirect costs are more difficult to assess, as their evaluation depends on various social conditions, such as functioning of the labour market.^{17,18} In addition to the above costs, there are also intangible costs of allergic rhinitis that are impossible to quantify. These would include loss of quality of life, social costs, psychological maladjustment, and 'pain and suffering', and would apply to the patient or the caregiver or both.

Table II. Economic burden of allergic rhinitis

Direct costs

Medical

- Doctor costs
- Medication
- Diagnostic tests (e.g. allergy tests)
- Over-the-counter medicines
- Alternative and complementary medicine
- Costs of training doctors

Non-medical

- Transport

Indirect costs

- Loss of work days
- School days lost

Intangible costs

- Loss of quality of life
- Social costs
- Psychological maladjustment
- 'Pain and suffering'

A large number of economic analyses of allergic rhinitis have been published. Most estimates of the annual cost of allergic rhinitis range from US\$2 billion to US\$5

billion (2003 values).¹⁹ The wide range of estimates can be attributed to differences in identifying patients with allergic rhinitis, differences in cost assignment, limitations associated with available data and difficulties in assigning indirect costs (associated with reduced productivity) of allergic rhinitis. Approximately one-third of burden-of-illness studies include direct and indirect costs of allergic rhinitis, about one-third focus on direct costs only, and the remaining one-third focus exclusively on indirect costs due to reduced productivity. Indirect costs attributable to allergic rhinitis were higher in studies only estimating indirect costs (US\$5.5-9.7 billion) than in those estimating both direct and indirect costs (US\$1.7-4.3 billion). An important intervention to reduce the cost of allergic rhinitis is to implement cost-effective therapeutic strategies. Although there are many economic evaluations of allergic rhinitis treatments in the published medical literature, very few represent formal cost-effectiveness evaluations that compare the incremental costs and benefits of alternative treatment strategies. No therapy that treats this serious condition can be thought of as being intrinsically cheap or expensive, it must be evaluated against the reduction in total cost of disease. Future work would benefit from the development of a consensus on a summary measure of effectiveness that could be used in cost-effectiveness analyses of therapies for allergic rhinitis.

CONCLUSION

Allergic rhinitis is not a trivial disease. In a country with a high prevalence and persistent disease like South Africa, the successful treatment of this condition needs greater attention. The burden of allergic rhinitis is borne on many fronts by patients and sufferers of this chronic condition. There are many guidelines available that stress the appropriate selection of cost-effective therapeutic strategies.^{20,22} We need to re-focus on allergic rhinitis as a disease with significant symptoms (many of them indirect), complications (including cognitive dysfunction and impaired quality of life) and cost (in all its forms). We have an opportunity now to reduce the burden of allergic rhinitis.

REFERENCES

1. ISAAC Steering Committee. Worldwide variation in prevalence of symptoms of asthma, allergic rhinitis and atopic eczema: ISAAC. *Lancet* 1998; **351**: 1225-1232.
2. Green RJ. Inflammatory airway disease. *Current Allergy & Clinical Immunology* 2003; **16**: 181-186.
3. Evans RM, Mullally DI, Wilson RW, *et al*. National trends in the morbidity and mortality of asthma in the US: prevalence, hospitalization and death from asthma over two decades, 1965 - 1984. *Chest* 1987; **91**: 65S-74S.
4. Juniper EF. Measuring health-related quality of life in rhinitis. *J Allergy Clin Immunol* 1997; **99**: 742s - 748s.
5. Meltzer EO. Quality of life in adults and children with allergic rhinitis. *J Allergy Clin Immunol* 2001; **108**(suppl): S45-53.
6. Schipper H, Clinch J, Powell V. Definitions and conceptual issues. In: Spilker B, ed. *Quality of Life Assessment in Clinical Trials*. New York: Raven Press, 1990: 1-24.
7. Guyatt GH, Naylor D, Juniper EF, *et al*. Users' guides to the medical literature. IX. How to use an article about health-related quality of life. *JAMA* 1997; **277**: 1232-1237.
8. Bousquet J, Bullinger M, Fayol C, Marquis P, Valentin B, Burtin B. Assessment of quality of life in patients with perennial rhinitis with the French version of the SF-36 health status questionnaire. *J Allergy Clin Immunol* 1994; **94**: 182.
9. De Graaf-in't Veld T, Koenders S, Garrelds IM, Gerth van Wijk R. The relationships between nasal hyperreactivity, quality of life and nasal symptoms in perennial allergic rhinitis. *J Allergy Clin Immunol* 1996; **98**: 508-513.
10. Juniper EF, Guyatt GH. Development and testing of a new measure of health status for clinical trials in rhinoconjunctivitis. *Clin Exp Allergy* 1991; **2**: 77-83.
11. Juniper EF, Guyatt GH, Dolovitch J. Clinical aspects of allergic disease. Assessment of quality of life in adolescents with allergic rhinoconjunctivitis: development and testing of a questionnaire for clinical trials. *J Allergy Clin Immunol* 1994; **93**: 413-423.
12. Juniper EF, Guyatt GH, O'Byrne PM, Viveiros M. Aqueous beclomethasone dipropionate nasal spray. Regular versus 'as required' use in the treatment of seasonal allergic rhinitis. *J Allergy Clin Immunol* 1990; **86**: 380-386.
13. Thompson AK, Juniper E, Meltzer EO. Quality of life in patients with allergic rhinitis. *Ann Allergy Asthma Immunol* 2000; **85**: 338-347.
14. Meltzer EO, Orgel HA, Bronsky EA, *et al*. A dose ranging study of fluticasone propionate nasal spray for seasonal allergic rhinitis assessed by symptoms, rhinomanometry and nasal cytology. *J Allergy Clin Immunol* 1990; **86**: 221-230.
15. Leynaert B, Neukirch C, Liard R, *et al*. Quality of life in allergic rhinitis and asthma: A population-based study of young adults. *Am J Respir Crit Care Med* 2000; **162**: 1391-1396.
16. Green RJ, Luyt DK. Clinical presentation of chronic non-infectious rhinitis in children. *S Afr Med J* 1997; **87**: 141-145.
17. Barnes PJ, Jonsson B, Klim JB. The costs of asthma. *Eur Resp J* 1996; **9**: 636-642.
18. Gergen PJ. Understanding the economic burden of asthma. *J Allergy Clin Immunol* 2001; **107**: S445-S448.
19. Reed SD, Lee TA, McCrory DC. The economic burden of allergic rhinitis: a critical evaluation of the literature. *Pharmacoeconomics* 2004; **22**: 345-361.
20. International Rhinitis Management Working Group. International Consensus report on the diagnosis and management of rhinitis. *Allergy* 1994; **19**: S1-S32.
21. Luyt DK, Green RJ, Davis G, *et al*. Allergic rhinitis in South Africa - diagnosis and management. *S Afr Med J* 1996; **86** (part 2): 1313-1328.
22. GLORIA. *Practical Treatment Guidelines for the Management of Allergic Rhinitis and Allergic Conjunctivitis*. Brussels: EAACI brochure: 2000.